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CENTRAL INTELLIGENCE AGENCY
INFORMATION REPORT

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COUNTRY USSR

SUBJECT BR-271 pmk Shell/Explosives in Military Use.

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BR-271 pmk Shell

2. "A new type streamlined sub-caliber shell with a metal-ceramic core (obtekaemyy podkalibrennyy snaryad s metallo-keramicheskim serdechnikom) has been constructed for the 57-mm antitank gun of the 1943 type. This sub-caliber shell has a greater range and a greater piercing capacity than existing shells. The official specifications include:

Index of Shell	-BR-271 pmk
Weight	-1.72 kg
Index of case	-UBR-271 p
Initial velocity of shell	-1270 m/second

3. "Compared to previous shells the piercing capacity of the new shell, when used against the armour of the former German tank 'Konigstiger' at an angle of 90°, is as follows:

Distance	100 m	200m	300 m	400 m	500 m
Former shell BR 271 p	175mm	169mm	160mm	152mm	140mm
New shell BR-271 pmk	195mm	188mm	173mm	164mm	152mm

4. "The core of shell BR-271 pmk is manufactured of a metal-ceramic alloy consisting of tungsten carbide (about 95 percent) and powdered cobalt, nickel and chromium. This mixture is pressed together at high pressure and baked at a temperature of about 1600°C. As a result of this procedure the core is harder than any metal and can stand a temperature of up to 1500°C.

5. "The shell BR-271 pmk has the outward appearance of an ordinary shell: a slender steel body; the core is placed in a special metal bushing (vtulka); the space between the bushing and the steel body of the shell is filled with a special light

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plastic mass.

Explosives in Military Use

6. "The students at the Leningrad Military Engineering Institute were taught in 1952 that the following high explosives are being used in the war industry of the USSR for the manufacture of artillery shells, mines, airplane bombs, detonators, etc:
- (a) Trotyl (~~to be [sic], TNT~~) - $C_2H_2/NO_2/3CH_3$ [sic]. The supply of raw material for this explosive is unlimited in the USSR. Production costs are low. Trotyl was described as the basic high explosive for the manufacture of the bursting charges of artillery shells, mines and airplane bombs. In blasting trotyl is a good substitute for melinite and pyroxylin. Mixed with hexogen [sic], trotyl is used for the manufacture of armor-burning shells.
 - (b) Picric acid (melinite) - $C_6H_2/NO_2/3OH$ [sic]. This is also available in unlimited quantities. It is used for charging special mines, airplane bombs, marine and antitank mines.
 - (c) Tetryl - $C_6H_2/NO_2/3N$ $\begin{matrix} CH \\ \diagup \\ 3 \\ \diagdown \\ NO_2 \end{matrix}$ [sic]. The raw material is available in sufficient quantity but manufacture is still more expensive than the manufacture of Trotyl. Tetryl is used for making detonators in the detonating fuse of artillery shells, as secondary charges in capsule detonators, and in detonating cords (fuses).
 - (d) Hexogen - $C_3H_6O_6N_6$ [sic]. The raw material available in unlimited quantity and used extensively in an alloy with trotyl for the charging of artillery shells (mainly ~~antitank~~ and antitank), in capsule detonators and detonating cords (fuses).
 - (e) Ten (?) $C/CH_2ONO_2/4$ [sic]. Available in unlimited quantity. Used to charge special antiaircraft and antitank artillery shells, as a secondary charge in capsule detonators and the detonators of special artillery shells.
 - (f) Dinitrobenzol - $C_6H_4/NO_2/2$ [sic]. Raw material base unlimited. Used as an additional and substitute high explosive in alloys and mixtures with trotyl and picric acid and as the chief component with ammonium nitrate.
 - (g) Ammonium nitrate - NH_4NO_3 [sic]. Used in a mixture with trotyl as 'ammonol' [sic], or mixed with trotyl and powdered aluminum as 'ammonal', for charging antiaircraft and antitank mines as well as various blasting works.

The substitute explosives xylin [sic] and dinitronaphthalin are no longer used in the USSR.

7. "The same students were taught that at present [Summer 1952] the main initiatory explosives are:
- (a) PbN₆ (a combination of lead and nitrogen). There are unlimited supplies of raw material for it. It is at present the main explosive in the manufacture of all sorts of capsule detonators.
 - (b) Fulminate of mercury - $Hg/ONC/2$ [sic]. Available in sufficient quantities and used in the manufacture of ignition capsules, capsule detonators and detonating cords (fuses).
 - (c) 'TNRS' - $C_6H/NO_2/3O_2PbH_2O$ [sic]. Available in unlimited quantities. Used in capsule detonators to help ignite $PbN_6(NO)$ as well as a substitute for fulminate of mercury.

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(d) C_2HON_{10} (Tetrazen [sic]). Used in some capsule detonators as a substitute for fulminate of mercury.

8. "No other high explosives were mentioned as in use to the students at the institute."

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